

## 2014/2015 VADEQ Citizen/Non-Agency Monitoring Activity Report

Since 2004, The Virginia Department of Environmental Quality (VADEQ) receives an ever increasing volume of data from sites from non-VADEQ organizations. Such examples include citizen volunteer groups, non-VADEQ government agencies, and private industry. Much of this data is included in the bi-annual 305(b)/303(d) *Integrated Water Quality Assessment Report* (Integrated Report). This report summarizes how the VADEQ interacted with non-VADEQ monitoring originations in 2014 and 2015.

### Citizen Monitoring Group Activities:

One of the ways DEQ tracks citizen monitoring is to identify the number of groups that have Level III Quality Assurance (QA) status, the highest data quality.

Monitoring groups who receive Level III status must meet three conditions:

1. Pass a DEQ field or (when applicable) laboratory audit
2. Possess a DEQ approved Quality Assurance Project Plan (QAPP) and field or laboratory Standard Operating Procedures (SOP)
3. Provide calibration and other quality control information to DEQ. This information must meet the specific criteria stated in the QAPP

Level III water quality data is equal in quality to results collected by VADEQ staff. Level III data allows VADEQ to assess water quality in areas with little or no VADEQ data. **Table 1** contains a list of Level III citizen monitoring groups, the number of stations, and parameters in the 2014 Integrated Report.

**Table 1-** Level III Citizen Volunteer Organizations and Academic Institutions:

Citizen Group	Member Groups	Level III Sites*	Level III Parameters
Alliance for Chesapeake Bay	8	53	Dissolved Oxygen (DO), temperature (temp)
Clean Virginia Waterways	1	25	E. coli
Dividing Creek Association	1	48	DO, pH, temp
Friends of Norfolk Environment	1	11	Enterococcus
Friends of the North Fork Shenandoah River	1	8	E. coli
Friends of the Shenandoah River (FOSR)	5	207	DO, E. coli, nutrients, pH, temp
Historic Green Springs Inc.	1	7	DO, nutrients, temp
Hoffler Creek Wildlife Refuge	1	1	DO, pH
Isle of Wight Ruritan Club	1	8	DO, temp
Lake Anna Civic Association	1	37	Chlorophyll a, DO, E. coli, pH, nutrients, temp
Leesville Lake Association	1	11	DO, pH, temp
McClure River Restoration Project	1	43	DO, E. coli, pH, temp
Nansemond River Preservation Alliance	1	7	DO
National Committee for the New River	1	39	DO, temp
Phi Theta Kappa Blue Ridge Community College	1	2	pH, temp
Poquoson Citizens for the Environment	1	21	pH, temp
Roanoke Valley Chapter Trout Unlimited	1	2	Temp
Smith Mountain Lake Association	1	72	DO, E. coli, pH, temp
Southern Appalachian Mountain Stewards	1	5	Metals
StreamWatch (Rivanna Conservation Alliance)	1	111	Macroinvertebrates
Timberlake Homeowners Association	1	11	Chlorophyll a, DO, E. coli, nutrients, pH, temp
United States Coast Guard Auxiliary Flotilla 33	1	7	DO, pH, temp
Westhaven Homeowners Association	1	4	Temp
<b>Total</b>	<b>34</b>	<b>740</b>	

\* Stations with accurate site coordinates and located away from permitted discharges

The VADEQ also receives a significant amount of data from Level II monitoring groups.

Level II indicates data from non-VADEQ monitoring organizations that have an approved Quality Assurance Project Plan or QAPP. However, field or laboratory methods may deviate from those used by VADEQ. However, the differences produce a similar result compared to a Level III method.

Level II groups provide data that is useful to the VADEQ to identify waters for future agency monitoring. In addition, the data can be useful to track water quality restoration activities. **Table 2** lists the citizen volunteer organizations which supplied Level II data for the 2014 Integrated Report.

**Table 2- Level II Citizen Volunteer Organizations and Academic Institutions:**

<b>Citizen Group</b>	<b>Member Groups</b>	<b>Level II Sites*</b>	<b>Level II Parameters</b>
Alliance for the Chesapeake Bay	+	8	DO, E. coli, pH, temperature
Blackwater/Nottoway Riverkeeper	1	11	DO, E. coli, pH, temperature
Chesapeake Beach Civic League	1	14	DO, E. coli, pH, temperature
Chesterfield RiverTrends	1	46	DO, E. coli, pH, temperature
Cowpasture River Preservation Association	1	21	E. coli
Cubitt Creek Monitors	1	10	E. coli
Fairview Beach Monitors	1	17	E. coli
Four Creeks Monitors	1	16	E. coli
Friends of Blacks Run Greenway	1	14	E. coli
Friends of Russell Fork	1	19	E. coli, temperature
George Mason High School	1	3	E. coli
Isle of Wight Ruritan Club	+	4	DO, pH, temperature
John Marshall SWCD	1	33	DO, E. coli, pH, temperature
Lord Fairfax SWCD	1	6	E. coli, temperature
Loudoun Wildlife Conservancy	1	14	E. coli, macroinvertebrate
Nelson County Master Gardeners	1	11	E. coli
Potomac Appalachian Trail Club	1	7	Macroinvertebrate, pH, temperature
Prince William SWCD	1	12	E. coli
Randolph Macon College	1	26	E. coli
RappFLOW	1	12	E. coli
Rippon Middle School	1	5	E. coli
Riverine Chapter- Virginia Master Naturalists	1	6	DO, E. coli, pH, temperature
Roanoke Valley Chapter Trout Unlimited	+	7	E. coli
Rockfish Valley Foundation	1	6	E. coli
Save Little Pimmit Run	1	5	E. coli
Smith Mountain Lake Association	+	36	Chlorophyll a, nutrients
Southside SWCD	1	21	E. coli
Thomas Jefferson SWCD	1	11	E. coli
Upper Tennessee River Roundtable	1	8	E. coli
Virginia Karst Monitors	1	2	DO, E. coli, pH, temperature
Virginia Save Our Streams	62	365	Benthic macroinvertebrate
<b>Total</b>	<b>88</b>	<b>776</b>	

\* Stations with accurate site coordinates and located away from permitted discharges

+ Organization member groups were tallied as part of Table 1

### **Citizen Monitoring Grant:**

The VADEQ routinely offers funds to support volunteer based monitoring. Grant applications are generally accepted during the summer of each year with awards distributed at the end of the year. Funds are used by the grant recipients for the following year with a report due shortly thereafter.

In 2014, the agency received \$116,430 in grant requests with \$88,000 available for awards. Of the 30 applications received, 24 received an award. The grant awards supported citizen volunteer related activities for the 2015 calendar year. Grant receipts will provide a final report with associated monitoring data in February of 2016.

In 2015, the agency received \$106,233 in grant requests with \$88,000 available for awards. Of the 29 applications received, 25 received an award. The grant awards will support citizen volunteer related activities for the 2016 calendar year. A final report including associated monitoring data is due in February of 2017.

[Appendix 1](#) contains more information about the FY2015 and FY 2016 Citizen Monitoring Grant recipients.

### **Citizen Monitored Stream Miles:**

In 2002, the Virginia General Assembly passed legislation establishing the Virginia Citizen Water Quality Monitoring Program ([§62.1-44.19:11](#)). During the 2007 General Assembly, House Bill 1859 amended the Code as follows: "It shall be the goal of the Department to encourage citizen water quality monitoring so that 3,000 stream miles are monitored by volunteer citizens by 2010."

Since 2008, the agency has used the Integrated Report to track the mileage contributions from non-VADEQ monitoring organizations. The Integrated Report assigns a length or area for each waterbody to allow the agency to assess water quality conditions. This provides the best available tool to track the data submitted to the agency.

The 3000 mile goal was met in 2010. In the 2014 Integrated Report, citizen groups monitored 3,642 stream miles of Virginia's surface waters. Citizen groups also monitored nearly 213.6 square miles of estuaries and 25,450 acres of reservoirs.

A list of the citizen monitoring groups along with their mileage contribution is in [Appendix 2](#). It is noted that some waterbodies were monitored by two or more organizations. To provide a fair calculation, waterbodies with more than one monitoring station is averaged in proportion to the number of stations each group has in the waterbody. For example, Group A monitored two sites and Group B monitored one site. Group A will receive credit for 2/3 of the area and Group B received 1/3.

### **Other Non-Agency Monitored Miles:**

During the 2014 Integrated Report, the VADEQ tracked the contributions of other monitoring organizations. These "non-agency" organizations consist of other government agencies, private businesses, and others who voluntarily provide data to the agency. It is noted that Soil and Water Conservation Districts (SWCD) are considered a citizen volunteer groups in these mileage calculations. This is due to their near universal relationship with having citizen volunteers collect and process samples.

[Appendix 3](#) of this report contains a list of non-agency groups and the mileage attributed to each.

For the 2014 Integrated Report, non-agency groups monitored nearly 1,367 stream miles. In addition, these organizations monitored 480.21 square miles of estuaries and 12,869 acres of reservoirs. As with the citizen data, the same method of assigning a proportional mileage or area based on the number of monitoring stations in the waterbody was applied.

### **Citizen Nominations:**

As required by Code of Virginia [§62.1-44.19:5.F](#) Water Quality Monitoring, Information and Restoration Act (WQMIRA), the VADEQ accepts nominations for future agency sampling. For 2014 and 2015, the agency received 17 nominations. Of the 17 nominations, the agency has the resources to perform follow up monitoring on 9 waterbodies for the 2015 and 2016 sampling years. **Table 3** lists the nominated waters that were monitored by DEQ.

**Table 3:** Nominated Waterbodies Prioritized for DEQ Monitoring

<b>Year</b>	<b>Stream Name</b>	<b>County</b>	<b>Parameter</b>	<b>Group</b>
2014	Bull Run	Loudoun	Macroinvertebrate	Loudoun Watershed Watch
2014	Callahan Creek	Wise	Metals	Southern Appalachian Mountain Stewards
2014	Goose Creek	Loudoun	Macroinvertebrate	Loudoun Watershed Watch
2014	Great Branch Creek	Chesterfield	DO, E. coli, nutrients, pH, temp	Concerned Citizens of Chesterfield
2014	Pound River, South Fork	Dickerson	DO, E. coli, nutrients, pH, temp	Lonesome Pine SWCD
2014	Rockfish River, South Fork	Nelson	DO, E. coli, nutrients, pH, temp	South Fork Rockfish River
2015	Maury River	Rockbridge	Macroinvertebrate	Private Citizen
2015	Stoney Run	Henrico	DO, E. coli, nutrients, pH, temp	Private Citizen
2015	Stoutemeyer Branch	Albemarle	Macroinvertebrate	Private Citizen

### **Public Outreach:**

The VADEQ actively engages the public through participating in community events. Agency staff frequently speaks at meetings and attend events to promote environmental stewardship and education. In addition many citizen monitoring organizations sponsor many of the events attended by VADEQ. In 2014 and 2015, agency staff participated in at least 23 events. [Appendix 4](#) provides additional details of these events.

### **Volunteer Monitoring Training:**

The VADEQ takes an active role in training and assisting citizen monitoring organizations to help train new volunteers. In addition, the agency routinely performs field and laboratory audits to ensure data received by the agency meets Level II and III requirements. In 2014 and 2015, VADEQ staff participated in 40 monitoring training and technical assistance events with various citizen monitoring groups. [Appendix 5](#) lists these training events DEQ staff participated in during 2013.

### **Citizen/Non-Agency Monitoring Database:**

The VADEQ Citizen/Non-Agency monitoring database at [www.deq.virginia.gov/easi/](http://www.deq.virginia.gov/easi/) has been available since January 2008 to allow groups to upload monitoring data. As of January 2016, the database contains over 2,700 sample sites comprised of over 35,000 sampling events. **Table 4** lists the groups who have accounts.

**Table 4:** Monitoring Organizations with Accounts at [www.deq.virginia.gov/easi/](http://www.deq.virginia.gov/easi/)

Abingdon WWTP	Leesville Lake Association
Alliance for the Chesapeake Bay	Lewis Ginter Botanical Garden
Arlington County Four Mile Run Monitors	Loudoun County
Blackwater/Nottoway Riverkeeper	Loudoun Watershed Watch
Cedar Creek Area Monitors	McClure River Restoration Project
Central Blue Ridge Virginia Master Naturalists	Nansemond River Preservation Project
Chesapeake Bay Governor's School	National Committee for the New River
Chesapeake Beach Civic League	Natural Bridge Monitors
Chesterfield County Office of Water Quality Protection (OWQP)	Northern Neck SWCD
Chesterfield Public Schools	Peninsula Chapter Virginia Master Naturalists (VMN)
Chesterfield WaterTrends	Pocahontas State Park
Chickahominy Swamp Rats	Poquoson Citizens for the Environment
City of Newport News	Potomac Appalachian Trail Club
City of Norfolk	Prince William SWCD
City of Suffolk	Randolph-Macon College
Clean Virginia Waterways	RappFLOW
Cowpasture River Association	Riverine Chapter VMN
Dividing Creek Association	Roanoke Valley Trout Unlimited
Edge Valley Preservation LLC	Rockfish River Monitors
Fredericksburg Area Monitors for the Environment (FAME)	SPARK Creek Watchers
Fairview Beach Residents Association	Save Our Streams
Four Creeks Coliscan Monitors	Smith Mountain Lake Association
Friends of Norfolk Environment	Southeast Community Action for a Renewed Environment (CARE)
Friends of Shenandoah River	Southside SWCD
Friends of Russell Fork	StreamWatch
George Mason High School	Thomas Jefferson SWCD
Goose Creek Association	Timberlake Homeowners Association
Historic Green Springs Inc.	Town of Dumfries
Isle of Wright Ruritan Club	Tye River Monitors
James River Association (JRA) River Watch	United States Coast Guard (USCG) Aux Flotilla 33
James City County	University of Virginia (UVA) pH Study
John Marshall SWCD	Upper Tennessee River Roundtable
Lake Anna Civic Association	Virginia Aquarium and Marine Science Center

## Appendix 1: List of FY2015 Citizen Monitoring Grant Awardees

Name of Organization	Project Details	Parameters	Locality or Region	Award
Alliance for the Chesapeake Bay	Continue the Alliance RiverTrends monitoring program	DO, E. coli, pH, temp, turbidity	Chesapeake Bay VA localities	\$11,000
Chesterfield RiverTrends	Continue volunteer monitoring in Chesterfield County	DO, E. coli, pH, temp, turbidity	Chesterfield	\$4,000
Chincoteague Bay Field Station	Continue volunteer monitoring in Accomack County	DO, E. coli, pH, temp, turbidity	Accomack	\$1,880
Dan River Basin Association	Establish a volunteer monitoring program around Martinsville and Danville	E. coli, Macroinvertebrate	Henry, Halifax	\$600
Department of Conservation and Recreation	To continue and expand volunteer monitoring in Bear Creek and Twin Lakes State Parks	Chlorophyll a, DO, nutrients, pH, temp	Cumberland, Prince Edward	\$1,041
Friends of Reston	Continue monitoring of waterbodies in Reston, VA	DO, macroinvertebrate, temp	Fairfax	\$1,000
Friends of the Shenandoah River	Continue long term monitoring of the Shenandoah River watershed covering nearly 3,000 square miles	DO, E. coli, nutrients, pH, temp	Shenandoah River watershed	\$9,000
George Mason High School	Student driven study to measure E. coli and develop bioremediation strategies.	E. coli	Fairfax	\$600
Izaak Walton League of America	Support the Virginia Save Our Streams program	Macroinvertebrates	Statewide	\$11,000
James River Association	Continue the James River Watch program	E. coli, turbidity	James River watershed	\$3,999
John Marshall SWCD	Develop a monitoring project with local high schools	DO, E. coli, macroinvertebrate, nutrients, pH, temp, turbidity	Fauquier	\$1,960
Lake Anna Civic Association	Continue ambient monitoring in and around Lake Anna	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Louisa, Orange, Spotsylvania	\$4,000
Lewis Ginter Botanical Garden	Continue baseline monitoring of the garden property	DO, E. coli, nutrients, temp	Richmond City	\$4,000
Lonesome Pine SWCD	Continue bacteria monitoring along the McClure River	DO, E. coli, pH, temperature	Buchanan, Dickenson	\$3,750
Longwood University	Bacteria monitoring in the Appomattox River watershed	E. coli.	Amelia, Cumberland, Prince Edward	\$4,000
Nansemond River Preservation Alliance	Continue monitoring along the Nansemond River	DO, E. coli, pH, salinity, temp, turbidity	Suffolk	\$3,350
Peninsula Master Naturalists	Establish a volunteer monitoring program.	E. coli, salinity, turbidity	Newport News, Hampton	\$970
Smith Mountain Lake Association	Continue Smith Mountain Lake monitoring program	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Bedford, Campbell, Franklin	\$9,000
StreamWatch	Expand monitoring activities in the Rivanna watershed	E. coli, macroinvertebrates	Albemarle, Fluvanna, Greene	\$2,450
Tri County/City SWCD	Establish a volunteer program in Fredericksburg	E. coli	Stafford	\$650
Trout Unlimited	Develop a gas shale monitoring program	Conductivity, pH, temp, turbidity	Allegheny, Augusta, Bath, Botetourt, Buchanan, Craig, Dickenson, Giles, Highland, Scott, Smith, Rockingham, Tazewell, Washington	\$1,000
Virginia Water Monitoring Council	Provide water quality information and distribute World Water Monitoring Day kits to schools.	N/A	Statewide	\$4,000
Virginia Aquarium and Marine Science Center	Provide low cost laboratory services for local citizen volunteer groups	DO, E. coli, nutrients, pH, temp	Hampton, Newport News, Norfolk, Virginia Beach	\$3,750
Wild Virginia	Develop a gas shale monitoring program.	Conductivity, metals, pH, temp turbidity	Augusta, Rockbridge, Highland, Bath	\$1,000

## List of FY2016 Citizen Monitoring Grant Awardees

Name of Organization	Project Details	Parameters	Locality or Region	Award
Alliance for the Chesapeake Bay	Continue the Alliance volunteer monitoring program	DO, E. coli, nutrients, pH, temp, turbidity	All localities that have tributaries to the bay	\$10,000
Chesterfield RiverTrends	Continue volunteer monitoring in Chesterfield County	DO, E. coli, pH, temp, turbidity	Chesterfield	\$3,920
Chincoteague Bay Field Station	Continue volunteer monitoring in Accomack County	DO, E. coli, pH, nutrients, temp, turbidity	Accomack	\$2,394
Cowpasture River Preservation Association	Continue water quality monitoring in the Cowpasture River watershed.	DO, E. coli, macroinvertebrate, nutrients, pH, temp, turbidity	Alleghany, Bath, Highland	\$2,100
Crozet Elementary School	Begin a classroom based stream monitoring program	DO, nutrients, pH, temp turbidity	Albemarle	\$1,000
Dan River Basin Association	Establish a volunteer monitoring program around Martinsville and Danville	E. coli, Macroinvertebrate	Henry, Halifax	\$3,340
Friends of the Shenandoah River	Continue long term monitoring of the Shenandoah River watershed covering nearly 3,000 square miles	DO, E. coli, nutrients, pH, temp	Shenandoah River watershed	\$10,000
Hampton Clean City Commission	Establish a monitoring project in Hampton, VA	E. coli, temp turbidity	Hampton	\$1,000
Izaak Walton League of America	Support the Virginia Save Our Streams program	Macroinvertebrates	Statewide	\$10,000
Jackson River Preservation Association	Establish a monitoring program on the Jackson River	Macroinvertebrates	Alleghany, Bath, Highland	\$767
James River Association	Continue the James River Watch program	E. coli, turbidity	James River watershed	\$3,944
Lake Anna Civic Association	Continue ambient monitoring in and around Lake Anna	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Louisa, Orange, Spotsylvania	\$4,000
Lewis Ginter Botanical Garden	Continue baseline monitoring of the garden property	DO, E. coli, nutrients, temp	Richmond City	\$4,000
Longwood University	Bacteria monitoring in the Appomattox River watershed	E. coli.	Amelia, Cumberland, Prince Edward	\$4,000
Lonesome Pine SWCD	Continue bacteria monitoring along the McClure River	DO, E. coli, pH, temperature	Buchanan, Dickenson	\$4,000
Magna Vista High School	Begin a classroom based stream habitat survey.	DO, pH, macroinvertebrates	Henry	\$997
Nansemond River Preservation Alliance	Continue monitoring along the Nansemond River	DO, E. coli, pH, salinity, temp, turbidity	Suffolk	\$3,500
Old Rag Chapter Virginia Master Naturalists	Expand a benthic macroinvertebrate program	Macroinvertebrate	Culpeper, Fauquier, Madison, Rappahannock, Orange	\$975
Peninsula Virginia Master Naturalists	Expand volunteer monitoring in the Lower James River.	E. coli, salinity, turbidity	Newport News, Hampton	\$3162
Peter Francisco SWCD	Establish a volunteer monitoring program	Macroinvertebrate	Buckingham, Culpeper	\$1000
Powhatan State Park	Develop a water quality monitoring and education program for the Powhatan State Park	DO, macroinvertebrate, nutrients, pH, temp	Powhatan	\$850
Prince William SWCD	Expand volunteer monitoring in Prince William County	Macroinvertebrate	Prince William	\$1000
Riverine Chapter Virginia Master Naturalists	Continue water quality sampling around Joseph Bryant Park	DO, E. coli, pH, temperature, turbidity	Richmond City, Henrico	\$1,000
Smith Mountain Lake Association	Continue Smith Mountain Lake monitoring program	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Bedford, Campbell, Franklin	\$8,051
Tri County/City SWCD	Continue and expand monitoring in Fredericksburg	E. coli	Stafford	\$3,000



## Appendix 2: 2014 305(b)/303(d) Mileage Contributions of Citizen Organizations

Citizen Monitoring Group Name	Stations	Estuary Mile <sup>2</sup>	Reservoir Acres	Stream Miles
Alliance for the Chesapeake Bay	61	15.613		111.07
Blackwater Nottoway Riverkeeper	11			24.25
Chesapeake Beach Civic League	14		205.18	
Chesterfield WaterTrends	46	1.719	115.31	126.84
Clean Virginia Waterways	25			56.82
Cowpasture River Preservation	21			115.05
Cubbit Creek Monitors	10	0.227		
Dividing Creek Association	48	2.017		
Fairview Beach Monitors	17	0.005		1.2
Four Creeks Monitors	16	1.915		
Friends of Blacks Run Greenway	14			10.95
Friends of Norfolk Environment	11	0.027		
Friends of Russell Fork	19			26.91
Friends of Shenandoah	207		0.24	733.5
George Mason High School	3			3.7
Historic Green Springs Inc.	7			33.98
Hoffler Creek Wildlife Refuge	1	0.053		
Isle of Wight Ruritan Club	12			23.3
John Marshall SWCD	33			76.33
Lake Anna Civic Association	37		9179.2	52.02
Leesville Lake Association	11		717.57	0
Lord Fairfax SWCD	6			7.53
Loudoun Wildlife Conservancy	14			46.24
McClure River Restoration	43			88.18
Nansemond River Preservation	7	4.602		
National Committee New River	39			176.74
Nelson County Master	11			66.65
North Fork Shenandoah River	8		45.44	15.15
Phi Theta Kappa	2			2.1
Poquoson Citizens Environment	21	0.319		0.35
Potomac Appalachian Trail Club	7			23.4
Prince William SWCD	12	0.545		33.79
Randolph Macon College	26			30.37
RappFLOW	12			14.99
Rippon Middle School	5			2.49
Riverine Virginia Master Naturalists	6			12.4
Roanoke Valley Trout Unlimited	9			12.84
Rockfish Valley Foundation	6			7.85
Save Little Pimmit Run	5			1.96
Smith Mountain Lake Association	108		15115.15	37.06
Southern Appalachian Mountain Stewards	5			5.4
Southside SWCD	21			108.19
StreamWatch (Rivanna Conservation Alliance)	111			399.91
Thomas Jefferson SWCD	11			56.18
Timberlake Homeowners Association	11		56.65	6.83
United States Coast Guard Auxiliary 33	7	186.528		
Upper Tennessee River Roundtable	8			21.39
Virginia Karst Monitors	2			7.79
Virginia Save Our Streams	365			1054.68
Westhaven Homeowners Association	4		15.12	5.96
<b>Citizen Monitoring Grand Total</b>	<b>1,516</b>	<b>213.568</b>	<b>25,449.86</b>	<b>3,642.34</b>



### Appendix 3: 2014 305(b)/303(d) Mileage Contributions of Non-Citizen Organizations

<b>Non-Agency Monitoring Group</b>	<b>Stations</b>	<b>Estuary Mile<sup>2</sup></b>	<b>Reservoir Acres</b>	<b>Stream Miles</b>
Appalachian Power	10	0	3663.69	0
Appalachian Technical Services	154	0	0	241.96
City of Norfolk Waterworks	18	0	2703.98	0
City of Suffolk Public Utilities	15	5.845	0	0
Cumberland Resources Corporation	2	0	0	5.77
DCR Beach Monitoring	24	0.229	2871.89	4.44
Edge Valley Preservation	8	0	0	20.56
Hampton Rhodes Sanitation District	18	106.361	0	0
James City County Stormwater	12	0.08	0	8.62
National Park Service Assateague Island	6	37.149	0	0
National Park Service Mid-Atlantic Network	48	0	0	84.91
National Park Service Northeast Coastal Barrier	99	21.607	0	0
Occoquan Watershed Monitoring Laboratory	15	0	1883.14	0
Old Dominion University	13	28.301	0	0
Page County Coliscan Monitors	21	0	0	58.9
Tennessee Valley Authority	3	0	1699.33	0
United States Forestry Service	128	0	0	452.93
United States Geological Survey	118	0	46.81	486.81
Virginia Department of Health	49	42.576	0	0
Virginia Institute of Marine Science	95	238.06	0	0
Wolf Creek Wastewater Treatment Plant	1	0	0	1.67
<b>Non-Agency Monitoring Grand Total</b>	<b>857</b>	<b>480.208</b>	<b>12,868.83</b>	<b>1,366.56</b>

## Appendix 4: 2014-2015 DEQ Public Outreach Events

1. **March 4, 2014: DEQ Tuesday Tidbit-** Webinar topic discussed how DEQ uses citizen volunteer data with DEQ staff and the public 30 people participated in the webinar held in Richmond.
2. **March 14 2014: Local Government Advisory Committee-** DEQ presented how the agency uses citizen volunteer data and how volunteer monitoring can help meet local government needs.
3. **March 15, 2014: Reedy Creek Coalition-** DEQ staff participated in a stream walk with volunteers of a local Richmond area stream. Event had 10 volunteers participate.
4. **April 28-May 2, 2014: National Water Monitoring Council Conference-** DEQ staff presented in multiple workshops and breakout sessions with a total of over 200 people attending these sessions, Cincinnati, OH.
5. **June 18, 2014: Virginia Water Monitoring Council Annual Summit-** DEQ staff attended and presented at the conference which had over 100 attendees. Henrico, VA
6. **September 15, 2014: Randolph Macon College-** Presented on a TMDL project for local waters where students would collect and test samples.
7. **September 24-25, 2014: Chesapeake Bay Watershed Conference-** Presented on how Virginia uses volunteer data to representatives from other Chesapeake Bay states, Shepherdstown, WV.
8. **October 9, 2014: Virginia Aquarium and Marine Science Aquarium-** Participated in an aquarium sponsored Lunch and Learn session to talk about water quality to 24 residents.
9. **November 8, 2014: Virginia Citizens for Water Quality Summit-** Headquarters staff presented at the conference and led a workshop training session on using the Virginia Environment Geographic Information System (VEGIS) service. Approximately 80 people in attendance. Ashland, VA.
10. **April 19, 2015- Richmond Earth Day-** Three DEQ staff led a water quality monitoring and benthic macroinvertebrate exhibit. Approximately 100 people stopped by the booth. Richmond, VA.
11. **April 23, 2015: Earth Day at Fort A.P. Hill-** DEQ staff participated in an Enviroscape demonstration for 800 to a 1000 3<sup>rd</sup> through 8<sup>th</sup> graders. Bowling Green, VA.
12. **May 14, 2015: Jackson River Preservation Association-** DEQ staff met with JRPA members to talk about developing a volunteer monitoring program. Warm Springs, VA
13. **May 20, 2015: Middle James Roundtable Meeting-** DEQ staff attended to provide information regarding the Middle James River TMDL and how citizen monitoring can help. Richmond, VA.
14. **May 20, 2015: Virginia Organizing-** DEQ staff met with seven people interested in developing a volunteer water quality monitoring project. Abingdon, VA.
15. **May 22, 2015: Deep Bottom on the James-** 50 students from Goochland High School spent the day learning about the Chesapeake Bay Watershed from two DEQ staff while canoeing down the James River. Richmond, VA.

16. **May 23, 2015: Virginia Junior Academy of Science-** DEQ staff helped judge research projects submitted by high school students across the state. Harrisonburg, VA
17. **July 7, 2015: VCU Summer Camp-** Two DEQ staff talked to students about water quality. Richmond, VA.
18. **August 6-8, 2015: Mid-Atlantic Monitoring Conference-** Organized by DEQ with support from US EPA, Shenandoah University, Friends of Shenandoah River, Virginia Water Monitoring Council and the Virginia Citizens for Water Quality. 135 people attended the conference to learn about volunteer monitoring and related activities occurring in the Mid-Atlantic States. Winchester, VA.
19. **August 25, 2015: Virginia Master Naturalists-** DEQ staff interviewed about the benefits and overview of how DEQ partners with volunteer groups. Video is available at [www.virginiamasternaturalist.org/aquatic-systems.html#video](http://www.virginiamasternaturalist.org/aquatic-systems.html#video). Henrico, VA.
20. **September 25- October 1, 2015: Virginia State Fair-** DEQ staff manned an interactive virtual reality stream exhibit and stream table. Doswell, VA.
21. **October 9, 2015: Roanoke River Currents Watershed Conference-** DEQ staff presented about how the agency uses water quality data with a focus of the association with the Smith Mountain Lake Association. Ferrum, VA.
22. **November 18, 2015: Virginia Citizen Monitoring Letter of Agreement signing agreement-** Representatives of the Alliance for the Chesapeake Bay, DEQ, Department of Conservation and Recreation, Virginia Citizens for Water Quality, and Virginia Department of Conservation and Recreation renewed the agreement to work together to support volunteer monitoring in Virginia. Richmond, VA
23. **November 19, 2015: Virginia Water Monitoring Council Conference-** DEQ staff presented and assisted with the conference concerning water quality monitoring and related scientific studies. Approximately 120 people attended. Henrico, VA.

## Appendix 5: 2014-2015 DEQ Volunteer Monitoring Training

1. **Coliscan Easygel Training-** As part of the DEQ commitment to support volunteer monitoring, the agency provided equipment and training on the use of the Coliscan Easygel™ method to detect E. coli bacteria. As part of the training, groups agreed to share their data with DEQ. The agency will use the data to track bacteria levels in the monitored watersheds. Below is a list of training events with groups who participated in the effort.
  - a. **April 5, 2014: Southeast CARE Coalition-** Provided Coliscan training to monitor waterways in Newport News.
  - b. **May 27, 2014: Nelson County Master Naturalists-** Training on using Coliscan on the Hardware River
  - c. **August 4, 2014: Fredericksburg Area Monitoring the Environment (FAME) -** Provided training for a new group monitoring in Stafford County.
  - d. **November 18, 2014: Natural Bridge area monitors-** Provided training and equipment on the Coliscan method to be used in three streams near Natural Bridge.
  - e. **May 19, 2015: Headwaters Soil and Water Conservation District-** Providing training to volunteers monitoring near Staunton, Virginia
  - f. **May 20, 2015: Beagle Ridge Chapter Virginia Master Naturalists-** Trained volunteers to monitor streams in Carroll and Wythe counties.
2. **February 26, 2014: Alliance for the Chesapeake Bay-** validated accuracy of monitoring equipment.
3. **March 21, 2014: Virginia Aquarium and Marine Science Center-** Audited laboratory used to process citizen volunteer samples for the greater Virginia Beach area.
4. **March 22, 2014: Alliance for the Chesapeake Bay-** Co-instructed volunteers as part of a City of Richmond volunteer monitoring project.
5. **March 27, 2014: James River Association-** Provided training space and validated thermometers used by the JRA River Rats program. Event held at DEQ Central Office in Richmond, VA
6. **April 5, 2014: Hoffer Creek Wildlife Refuge-** Provided training to use new water quality equipment in Suffolk, VA
7. **April 14, 2014: Lake Anna Civic Association-** Inspected and verified accuracy of field monitoring equipment in Spotsylvania County.
8. **May 6, 2014: Pocahontas State Park-** Inspected and verified accuracy of field monitoring equipment used to sample several state lakes in Culpeper and Prince Edward Counties.
9. **June 2, 2014: Lake Anna Civic Association-** Follow up inspection of equipment and provided technical support on using water quality sensors in Spotsylvania County.
10. **June 28, 2014: Southeast CARE Coalition-** Reviewed sampling and testing methods for new volunteer group in Newport News.

11. **July 16, 2014: Lewis Ginter Botanical Garden-** Met new volunteers and reviewed sampling protocols in Richmond
12. **August 4, 2014: Lake Anna Civic Association-** Went over sample coordination with DEQ station and demonstrate a new type of monitoring probe to replace current equipment, Spotsylvania County.
13. **August 7, 2014: McClure River Restoration Project-** Audited laboratory facilities and methods used to monitor for E. coli bacteria and field parameters using electronic probes, Dickenson County.
14. **September 23, 2014: Virginia Save Our Streams-** Filmed VASOS Rocky Bottom method with two volunteers on the Roanoke River in Roanoke County. Training video available at [www.vasos.org/monitors-page/training-resources/](http://www.vasos.org/monitors-page/training-resources/)
15. **September 10, 2014: Virginia Save Our Streams-** Filmed VASOS Muddy Bottom Method with 15 volunteers at Zoar State Forest in King William County. Training video available at [www.vasos.org/monitors-page/training-resources/](http://www.vasos.org/monitors-page/training-resources/)
16. **October 6, 2014: Randolph Macon College-** Reviewed analytical methods used by students as part of a TMDL project, Hanover County.
17. **October 18, 2014: James River Chapter, Virginia Master Naturalists-** Trained new volunteers on water quality sampling and testing, Goochland County.
18. **November 3, 2014: Friends of the Shenandoah River-** Audited and validated field and laboratory procedures and equipment.
19. **March 14, 2015: Historic Green Springs-** DEQ staff assisted with training of 7 volunteers on collecting samples and calibrating field equipment.
20. **March 15, 2015: Riverine Chapter Virginia Master Naturalists-** DEQ staff assisted with training of 23 volunteers on collecting samples and validated field equipment.
21. **April 20, 2015: Lake Anna Civic Association-** DEQ staff validated monitoring equipment.
22. **April 23, 2015: Pocahontas State Park-** Staff inspected and validated monitoring equipment.
23. **April 23, 2015: James River Association-** Staff validated monitoring equipment and assisted with training of volunteers for the James River Watch program.
24. **May 12, 2015: Virginia Aquarium and Marine Science Center-** Inspected and validated laboratory equipment and procedures used to analyze citizen volunteer collected samples.
25. **May 20, 2015: McClure River Restoration Project-** Staff inspected and validated laboratory equipment.
26. **June 2, 2015: Lake Anna Civic Association-** DEQ staff performed a field audit of sample teams.
27. **July 14, 2015: Cowpasture River Preservation Association-** Assisted with training of 15 volunteers on various field monitoring methods.

28. **July 27, 2015: Smith Mountain Lake Association-** Staff performed a laboratory audit on procedures and validated laboratory and field equipment.
29. **August 3, 2015: Lake Anna Civic Association-** Staff reviewed findings from the June 2 field audit.
30. **August 17, 2015: Quality Assurance Project Plan development webinar-** staff provided guides and references to multiple organizations submitting project plans to the agency.
31. **September 21, 2015: Lewis Ginter Botanical Garden-** Staff provided refresher training on maintaining field equipment and validated sampling procedures.
32. **September 23, 2015: Nansemond River Preservation Alliance-** DEQ staff provided training to new volunteers on water sampling methods.
33. **September 24, 2015: Culpeper Soil and Water Conservation District-** Staff provided training on proper collection of bacteria samples using various sampling methods. Session was recorded for development into a training video.
34. **November 4, 2015: Alliance for the Chesapeake Bay-** Staff assisted with training of volunteers located in the Northern Neck region of Virginia.